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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,939	08/30/2002	Robert William Bruce	13DV-13676	3625

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EXAMINER

MCNEIL, JENNIFER C

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 04/23/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

10/064,939

Applicant(s)

BRUCE ET AL.

Examiner

Jennifer McNeil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-10, 16-23, 25 and 26 is/are rejected.
- 7) ☒ Claim(s) 7, 11-15, 24 and 27-31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 August 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1, 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Amano et al (US 4,774,150). Amano teaches a thermal barrier coating comprising zirconia, yttria, and samaria (col. 2, lines 25-42). Regarding claim 17, a bond coat may be present between the substrate and the thermal barrier coating.

Claims 1, 8, 17, 18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Stecura (US 4,535,033). Stecura teaches a thermal barrier coating comprising zirconia, yttria, and ytterbia. Regarding claims 8 and 19, Stecura teaches that the ytterbia is added in an amount of 12.4 wt%, which falls within applicants claimed range. Regarding claim 17, a bond coat may be present between the substrate and the thermal barrier coating (col. 2, lines 38-40). Regarding claim 18, the substrate may be a turbine engine blade (col. 1, lines 41-45).

Claims 1-6, 8-10, 16-23, 25, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Rickerby et al (US 6,025,078). Rickerby teaches a thermal barrier coating comprising zirconia, to

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which is added yttria and additionally, one of neodymia, dysprosia, gadolinia, erbia, or ytterbia. The yttria is added in an amount of 4-20 wt%, and the additional oxide is added in an amount of 4-25 wt%.

Each of the ranges claimed by applicant overlap with the above ranges.

Regarding claim 17, a bond coat may be present between the substrate and the thermal barrier coating (col. 3, lines 55-65).

Regarding claim 18, the coating may be applied to a turbine engine blade (col. 1, lines 5-10).

Claims 1, 8, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Schulz et al (US 6,127,006). Schulz teaches heat insulating layers applied to turbine blades. The layers comprise zirconia and ytterbia in the amount of 1-20 mol%. This range is considered overlapping with applicants range.

Claims 1, 4, 5, 18, 19, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Maloney (US 6,284,323). Maloney teaches a thermal barrier coating comprising zirconia, gadolinia, and yttria. The gadolinia may be added in an amount of 5-60 mol%, and the yttria is added in an amount of about up to 25 mol%. These ranges are considered overlapping with applicant's ranges.

Claims 1, 2, and 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Alperine et al (US 6,333,118). Alperine teaches a thermal barrier layer comprising zirconia and dysprosia. The dysprosia is added in an amount of 2-30 wt%. Regarding claim 17, a bond coat may be present between the substrate and the thermal barrier coating. Regarding claim 18, the coating may be applied to blades.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Amano et al (US 4,774,150). Amano teaches a thermal barrier coating comprising zirconia, yttria, and samaria (col. 2, lines 25-42). Regarding claim 17, a bond coat may be present between the substrate and the thermal barrier coating. Amano teaches the application of the coating to turbine engine components but does not specifically teach an airfoil. Airfoils are exposed to high temperatures and corrosive environments, and as such it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the thermal barrier coating of Amano to a blade of a turbine engine to provide a barrier to the corrosion and that indicates thickness.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stecura (US 4,535,033). Stecura teaches a thermal barrier coating comprising zirconia, yttria, and ytterbia as discussed above, but does not give additional ranges for the concentration of ytterbia. Absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to add ytterbia in an amount to achieve the desired stability of the zirconia, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

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Claims 1-6, 8-10, 16-23, 25, and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Rickerby et al (US 6,025,078). Rickerby teaches a thermal barrier coating comprising zirconia, to which is added yttria and additionally, one of neodymia, dysprosia, gadolinia, erbia, or ytterbia. The yttria is added in an amount of 4-20 wt%, and the additional oxide is added in an amount of 4-25 wt%.

Each of the ranges claimed by applicant overlap with the above ranges. Furthermore, absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the additional oxide in an amount to achieve the desired thermal conductivity of the zirconia, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Claims 1, 8, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schulz et al (US 6,127,006). Schulz teaches heat insulating layers applied to turbine blades. The layers comprise zirconia and ytterbia in the amount of 1-20 mol%. The range claimed by applicant overlaps with the above ranges. Furthermore, absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the ytterbia in an amount to achieve the desired stabilization of the zirconia, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Claims 1, 4, 5, 18, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maloney (US 6,284,323). Maloney teaches a thermal barrier coating comprising zirconia, gadolinia, and yttria. The gadolinia may be added in an amount of 5-60 mol%, and the yttria is added in an amount of about up to 25 mol%. These ranges are considered overlapping with applicant's ranges.

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Each of the ranges claimed by applicant overlap with the above ranges. Furthermore, absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the additional oxide in an amount to achieve the desired stabilization of the zirconia, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Claims 1, 2, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alperine et al (US 6,333,118). Alperine teaches a thermal barrier layer comprising zirconia and dysprosia. The dysprosia is added in an amount of 2-30 wt%. The range claimed by applicant overlaps with the above ranges. Furthermore, absent a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the dysprosia in an amount to achieve the desired stabilization of the zirconia, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

*Allowable Subject Matter*

Claims 7, 11-15, 24, and 27-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer McNeil whose telephone number is 703-305-0553. The examiner can normally be reached on Monday through Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 703-308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



JCM  
April 20, 2003

Jennifer McNeil  
Examiner  
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